CHAPTER XVI

GAS AND AIR ON THEIR WAY THROUGH THE FURNACE SYSTEM

THE gas and air must, on their way through the entire furnace system, be kept well apart from each other and only be allowed opportunity to unite in the combustion chamber. Producer gas possesses a tolerably high ignition temperature, and if air reaches the gas at high temperature, it burns a portion of the gas, and this becomes lowered in value correspondingly to the air introduced. If, however, the air enters the gas below its ignition point, an explosive mixture results, which on ignition by a hot part of the furnace system is able to be the cause of the most serious disasters.

Precautions must, therefore, be taken that the air cannot enter the gas conduits, and that is achieved most simply if the gas in the conduits continually is under surplus pressure, whereby the consequence of any leak holes is only that some gas makes its way into the free atmosphere. In the furnace itself the walls which divide the gas spaces from the air spaces in the ports and chambers must be absolutely gas-tight, and during each furnace repair must be carefully tested and correspondingly brought into good condition, since otherwise the furnace soon comes to a stoppage. Also the reversing arrangements must be gas-tight.

At this place, it is unavoidable, however, at odd times to avoid a coming together of gas and air, namely, during the changing of direction of the flame by reversing. At this instant, the air passages, as well as the gas passages, are brought into direct communication with the chimney, which then simultaneously sucks out gas and air. Of course, this occurrence can be somewhat modified according to the kind of reversing devices. With the old Siemens clappers, one reversed each valve by itself, and each such operation was ended in a very short time. One can thereby attain that very little gas finds its way from the gas tube into the chimney flue. But after the gas flapper has